

Bitter Herb Differentials

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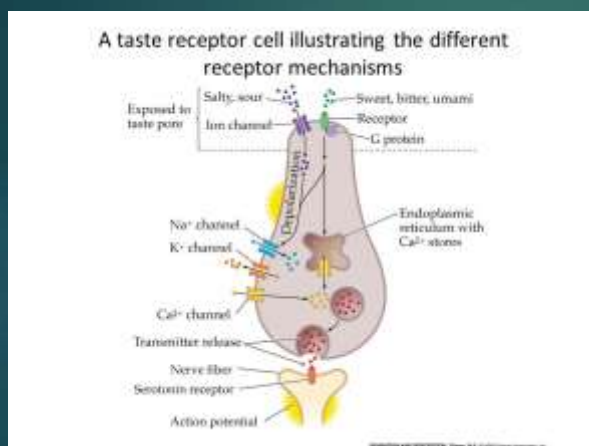
Bitter receptors

- ▶ Nomenclature: TAS2R = bitter receptor genes
- ▶ AT least 36 present in humans
- ▶ TAS2R38 is the best studied
- ▶ Widely distributed in human tissues.
- ▶ Tongue, all regions of digestive tract, pancreas
- ▶ Airways, white blood cells, heart, brain, thyroid, skin, placenta, testes.
- ▶ The physiological relevance of the extra-oral receptors remains largely uninvestigated.

Ligands

- ▶ Bitter substances in food
- ▶ Products of bacterial metabolism
- ▶ Quorum-sensing molecules from biofilms (possible)
- ▶ Endogenous ligands have not been discovered.
- ▶ **Open question:** Do bitter substances in food or herbal medicines circulate and affect the extragastrintestinal receptors?

Effects



Depending on cell type, binding to the bitter receptor cause produce

- Nerve stimulation
- Smooth muscle effects
- Hormonal effects in gut
- Secretion of gut peptides that may affect insulin sensitivity.
- Secretion of antimicrobial proteins (defensins)

Specific effects on digestive process

- ▶ Stimulate digestive hormones
- ▶ Increase digestive secretions from stomach, intestine, and bile duct
- ▶ Increase peristalsis
- ▶ Increase appetite
- ▶ Smaller doses and milder bitters may be as effective as strong

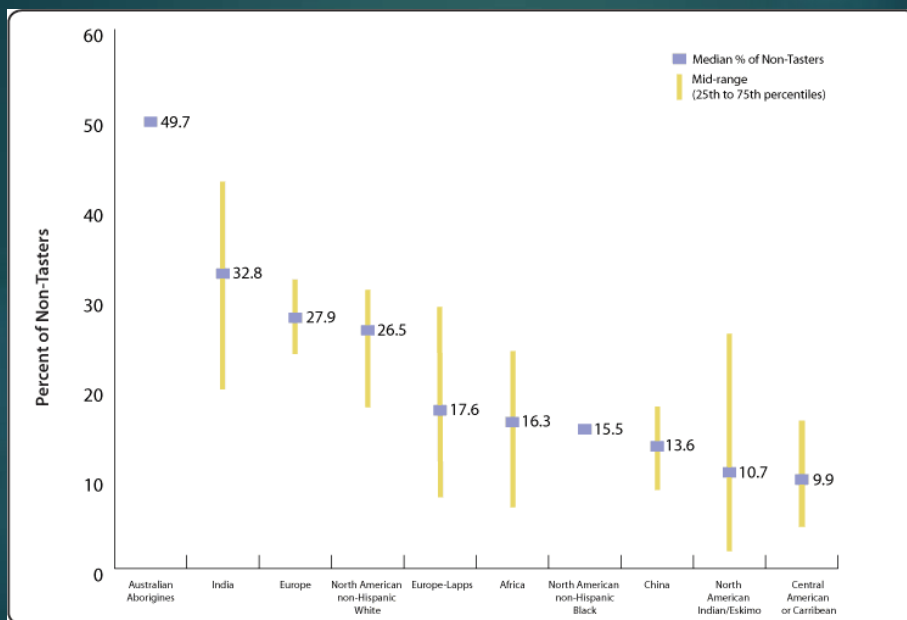
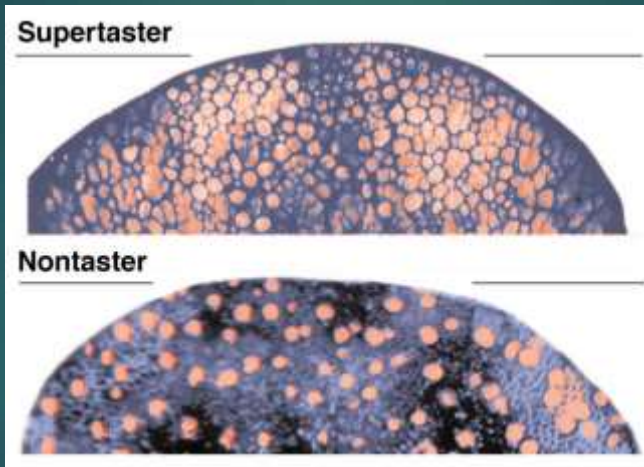
Lung receptors and immunity

- ▶ It is established that bitter receptors in the airway and lung can respond to inhaled bitter substances and produce enhanced innate immunity.
- ▶ **Question:** Could the use of aromatic bitter plants as smudges be delivering effective stimulation to the respiratory bitter receptors and enhancing immunity.
- ▶ Note also the aerosolized aromatic substances have direct antimicrobial properties and some have anti-biofilm effects
- ▶ Artemisias, Salvia, Juniper.

Tasting bitter

Tongue receptors

- ▶ Genetically determined. Varies by age, gender, nationality
- ▶ The density of all receptors may contribute
- ▶ The density of bitter receptors and their reactivity.
- ▶ The result is a wide range of ability to taste bitter
- ▶ 25% are "super-tasters" and can taste bitters at concentrations that others cannot.
- ▶ 40% are normal tasters
- ▶ The remaining 35% are "non-tasters" and require higher concentrations of bitter to detect it than normal or supertasters.



NAIMH tasting experiments

	Dandelion	Calendula	Scullcap	Valerian	Chamomile
	n = 73	n = 64	n = 47	n = 61	n = 56
Bitter not sweet	77.00	83	79	71	50
Bitter and sweet	23.00	11	13	19	34
Total bitter	100.00	94.00	92.00	90	84.00
Sweet not bitter	0.00	3	4	2	7
Total Sweet	23.00	14.00	17.00	21.00	41.00
Not sweet not bitter	0.00	2	4	8	7
Total non-bitter	0.00	5	8	10	16

	Scullcap tinc.	Raspberry lf	Echinacea a.	Viburnum op	Arctium
	n = 47	n = 53	n = 66	n = 52	n = 85
Bitter not sweet	61	48	47.00	48.00	25.00
Bitter and sweet	23	35	23.00	17.00	30.00
Total bitter	83.73	83	70.00	65.00	55.00
Sweet not bitter	14	11	18.00	13.00	28.00
Total Sweet	36.73	46.00	41.00	30.00	58.00
Not sweet not bitter	3.00	6	12.00	21.00	17.00
Total non-bitter	17.00	17	30.00	34.00	45.00

	Marshmallow	Trifolium	Nettle	Melissa	Licorice rt
	n = 23	n = 72	n = 71	n = 56	n = 54
Bitter not sweet	5	25	24	25	2
Bitter and sweet	41	19	19	12.5	26
Total bitter	46.00	44.00	43.00	38	28
Sweet not bitter	41	31	34.00	39	72
Total Sweet	82.00	50.00	53.44	51.50	98.00
Not sweet not bitter	13	25	23.00	22	0
Total non-bitter	54	56	57.00	61	72

Humoral effects of the bitter taste

- ▶ Cooling to cold
- ▶ Drying
- ▶ Draining
- ▶ Tonic/astringent
- ▶ Sinking
- ▶ Chinese: for heat, stomach heat, other forms of heat
- ▶ Western: heat with dampness.

The Cold Injury of Bitter Herbs

- ▶ Culpeper: Life is warmth and cold is death, and that is why the Good Lord has placed so many warming herbs on the face of the Earth. And that is why cold herbs should not be persisted in.
- ▶ A caution from the times of Hippocratic and Galenic medicine
- ▶ A standard warning in Chinese medicine.
- ▶ Caution with persistent, and especially habitual use.

Case study.

- ▶ A woman in her late teens came with digestive and skin issues. The presentation was hot, and the patient reported lifelong signs of a warm constitution.
- ▶ An herbalist recommended a tincture of equal parts Taraxacum and Mahonia, 1-2 droppers 3-4 times a day. This was to be an initial short-term treatment.
- ▶ The patient did not return for follow-up, but refilled the tincture on her own.
- ▶ Within six weeks, the woman's digestion was cold and deficient, and she has prominent signs of constitutional cold.
- ▶ A restorative program for more than 2 months failed to correct her cold metabolism and digestion.

Sings of heat in the physiology

- ▶ Heat Signs and types of heat
- ▶ red face, red eyes
- ▶ red tongue
- ▶ yellow tongue coat
- ▶ yellow sputum
- ▶ feelings of heat (soles, palms, chest) (fewer clothes or bed covers)
- ▶ agitation, insomnia
- ▶ dry throat
- ▶ dark scanty urine
- ▶ hot burning urination
- ▶ yellow vaginal discharge
- ▶ dry stool

Cautions

- ▶ Cold and dry patient
- ▶ Patient with cold and/or dry digestion
- ▶ Dry patient with heat signs (False fire/Deficient Yin)
 - ▶ Mild bitters, never strong.
 - ▶ Demulcent bitters (see section in slide show)

Modification in formula

- ▶ Commonly a portion of warming herbs is added to a bitter formula
- ▶ In Physiomedical medicine, bitters would be delivered in syrups, which will counter the drying effects
- ▶ Ginger Syrup (warming, plus moistening)
- ▶ Prunus syrup (tonic/astringent plus moistening)
- ▶ Neutralizing cordial (balanced warm/cool plus moistening)

Bitter Alteratives

Alteratives

- ▶ Herbs which support or stimulate one or more avenues of physiological detoxification.
- ▶ Liver, Kidney, Bowel, Extracellular (immune), nutritive
- ▶ Most alteratives are bitter, cold, drying, and draining.
- ▶ Most alteratives should be given with consideration for the humoral requirements for bitters, specifically best suited to warm and damp conditions, contraindicated in cold and dry.

Differentiate warm vs cool

- | | |
|--------------------------|-------------|
| ▶ Arctium | ▶ Juniperus |
| ▶ Taraxacum | ▶ Anemopsis |
| ▶ Mahonia | ▶ Thuja |
| ▶ Eupatorium perfoliatum | ▶ Allium |
| ▶ Hydrastis | ▶ Etc . |
| ▶ Rumex | |
| ▶ etc | |
-
- ▶ Traditional alterative formulas typically modified with Capsicum, Zingiber, Zanthoxylum
 - ▶ Juniper is excellent warming alterative and corrector for a cold formula. Pairs well in equal parts with Taraxacum

Bitter Tonic-Astringents

Stronger bitters with strong drying effects

- ▶ Gentiana
- ▶ Oregon Grape
- ▶ Hydrastis

Basis for digestive bitter formulas, combined with aromatic/carminative(s)

Gentiana

- ▶ Small doses as a simple may aid in the nausea of pregnancy (Ellingwood)
- ▶ Use alone in small doses of the tea or tincture as a pre-meal bitter tonic.
- ▶ Mix with Ginger in equal parts for a simple pair for weak digestion. Traditional variations (Gentiana:Zingiber 3:1 or 2:1)
- ▶ Combine with Citrus peel and Coriandrum for a stronger bitter tonic effect focused on the upper to increase appetite, digestive power, and assimilation.

- ▶ Combine with *Eupatorium perfoliatum* and a small amount of *Capsicum* for more effect on the secreting glands of the intestine and liver.
- ▶ Combine with *Eupatorium perfoliatum* and a stronger laxative, such as *Rheum*, *Aloe*, or *Cassia senna* for more directed effects to the lower bowel.
- ▶ Combine with *Hydrastis* and *Collinsonia* to tonify the portal venous system, as indicated by hemorrhoids or varicosities.

Hydrastis

- ▶ Chief digestive indication: atonic conditions of the stomach, intestines, and lower bowel.
- ▶ Per John Uri Lloyd (Eclectic pharmacologist) Hydrastis with the alkaloids removed is "the most powerful astringent in our materia medica."
- ▶ With Gentiana and Cardamom for atonic digestive system
- ▶ With Filipendula and Matricaria for stomach conditions
- ▶ As bitter alterative, base formula on Hydrastis:Arctium 1:4

Populus spp

- ▶ A primary bitter tonic/astringent of the Thomsonian/Physiomedical schools.
- ▶ Thomson: Spiced Bitters (modified). Indication: debility
 - ▶ Populus 14
 - ▶ Zingiber 4
 - ▶ Hydrastis 4
 - ▶ Cinnamomum 2
 - ▶ Eugenia 2
 - ▶ Zanthoxylum 1
 - ▶ Capsicum 1

18 parts bitter, 10 parts warming carminative; all parts are dry

Traditional to deliver as powder in equal parts of sugar, which corrects dryness

Milder bitters

- ▶ Matricaria is a primary mild bitter, with mixed carminative, anti-inflammatory, and mild sedative effects
- ▶ Filipendula is primary upper GI tract mild bitter.
- ▶ Many other herbs presented here are mild.
- ▶ Principle of vitalism: "Never use a strong herb when a mild herb will do."
- ▶ The combination of the two is standard in Physiomedicalist tradition, with the addition of a third stronger bitter such as Hydrastis, Artemisia, or Salvia

Aromatic Bitters

- ▶ **Achillea**
- ▶ **Artemisia**
- ▶ **Salvia**
- ▶ Aromatics modify the coldness of the bitter principles
- ▶ Each is diaphoretic taken hot, astringent/tonic and diuretic taken cold.
- ▶ Each is emmenagogue taken hot, hemostat taken cold.
- ▶ Cooling through bitterness or through diaphoresis
- ▶ *Artemisia and Achillea are considered equivalents for substitution in Unani medicine.*
- ▶ *Combine Artemisia and Salvia 1:1 for most purposes.*
- ▶ *Salvia more astringent than the others*
- ▶ *Pimpinella (anise) used as corrective in Unani Tibb.*

Bitter Mints

Bitter mints

- ▶ *Leonurus*
 - ▶ *Lycopus*
 - ▶ *Verbena*
 - ▶ *Nepeta*
- ▶ Bitter tonics
 - ▶ Cool energy
 - ▶ Dry humidity
 - ▶ Varying degrees of bitter and pungent
 - ▶ Vital stimulant, relaxant, (astringent)
 - ▶ Diffusive diaphoretic taken hot
 - ▶ Diuretic taken cold
 - ▶ Emmenagogue

	Tone	Nervine sedative	Respiratory effects
<i>Leonurus</i>	relaxant	yes	relaxes deepens
<i>Lycopus</i>	Relaxant/ asttringent	yes	sedative; astringent; bloody cough ; free expectoration, chronic cough
<i>Verbena</i>	relaxant	yes	expectorant asthma whooping cough
<i>Nepeta</i>	relaxant	yes	antitussive/asthma

Bitter sedatives

Bitter sedatives

When insomnia, anxiety, and irritability are due to constitutional or environmental dryness, bitter sedatives may aggravate the condition as the effect of dryness outweighs the sedative effect. Best when heat signs are present.

- ▶ Scutellaria
- ▶ Passiflora
- ▶ Verbena
- ▶ Humulus
- ▶ For cold patient consider Valeriana, with bitter and warming constituents mixed.

- ▶ Correct with *Glycyrrhiza* in tincture
- ▶ Correct with *Althaea* in decoction
- ▶ Deliver in demulcent tea
- ▶ Use demulcent rather than sedative/hypnotic strategy
- ▶ See Bitter demulcents

Bitter demulcents

Bitter demulcents

Predominant demulcent effects are corrective to mild bitter

Primary remedies for the hot dry patient (False fire, deficient yin)

- | | | |
|---|------------------------|---|
| ▶ Viola odorata, tricolor | cool (lf)
cold (rt) | mild bitter, whole plant
with roots is more bitter |
| ▶ Asparagus spp
(Shatavari; Tian Men Dong) | cold | powerful endocrine and
reproductive restorative) |
| ▶ Polygonatum spp | cool | mild bitter, endocrine
and reproductive
restorative |

Patient should have heat signs to receive Asparagus or Viola rt, or these may cause cold injury.

Bitter Anodynes

Bitter and relaxant anodynes

	Temp	Sedative	Anodyne	Antispasmodic	Anxiolytic
Lactuca 4	cold	mild	x	x	
Piscidia 2	cold	mild	x	x	
Eschscholtzia	cool	mild	x	x	x

Piscidia erythrina

- ▶ Combines bitter cooling, sedative, antispasmodic, and anodyne effects
- ▶ An important primary anodyne for almost 200 years
- ▶ A historical substitute for opium
- ▶ Low dose herb not to exceed 12 drops tincture. May have toxicity at high.
- ▶ Because the dose is low, the bitter humoral effect is minimized

Lactuca spp.

- ▶ Standard tincture is mild
- ▶ Tincture of the concentrated white latex (lactarium) was the standard Eclectic medical preparation.
- ▶ Very effective sedative and dulling to pain perception as a tea.

Deliver anodyne tinctures in decoction of Lactuca

Note: powerful respiratory relaxant with 2-3 puffs **smoked**

Bitter laxative/tonics

IMPOTANT DIGESTIVE TONICS IN SUB-LAXATIVE DOSES

Berberis

- ▶ *Berberis vulgaris*.
- ▶ Bitter cholagogues in general are laxative through effects of bile
- ▶ Rheum off.
- ▶ *Cassia angustifolia*
- ▶ *Rhamnus purshiana/frangula* (*Cascara sacrada/buckthorn*)

Rheum off.

- ▶ Combines stimulant laxative effects with bitter tonic/astringent effects.
- ▶ Laxative properties are due to anthraquinone glycosides, but unlike other anthraquinone laxatives, its astringency tonifies the bowels after purgation, and the bitter effects tonify and normalize secretions of the stomach, intestines, and liver.
- ▶ In both Chinese and Unani medicine, as well as the Western tradition, it is noted for its uses in both constipation and diarrhea. Use smaller doses for diarrhea.
- ▶ Large doses are contraindicated in weak or feeble individuals, and heat signs should be present for administration of full doses, unless corrected with warming herbs.
- ▶ Full cathartic doses can induce a rebound constipation due to its astringency. This may also occur also with chronic use, so it is best suited for acute applications.

- ▶ For full catharsis, combine with Disocorea and Zingiber (Priest)
- ▶ For functional dyspepsia, combine with Hydrastis (Priest, Ross)
- ▶ For constipation with heat, Combine with Taraxacum (Ross)
- ▶ Combine with Taraxacum to reinforce cooling effects and stimulation of digestive and hepatic secretions (NAIMH)
- ▶ Combine with Cinnamon to correct coldness, allows the herb to be given in a broader range of patients without distinct heat signs.
- ▶ Combine with Rhamnus purshiana for laxative purposes. (Ross) Both are laxative due to anthraquinone glycosides, but Rheum contributes astringency and Rhamnus and has broader bitter tonic effects.

Neutralizing Cordial

- ▶ Rheum 4 oz
- ▶ Mentha pip 8 oz
- ▶ Hydrastis 1 oz
- ▶ Cinnamomum 1 oz
- ▶ Potassium bicarbonate 1.5 oz.

Macerate in 1 qt of 40% alcohol. Add potassium after filtering. Add 4 lbs of sugar for basic simple syrup. Substitute Glycerine.

For variety of digestive complaints, with heat.

Use as delivery medium for stronger bitters.

Cassia

- ▶ Stronger than the other laxatives in this section
- ▶ Senna is better for one-time or short term use in acute constipation than for regular use in chronic conditions.
- ▶ After purgation, Senna leaves the bowels in a relaxed state. Compare to Rheum which has the opposite effect. For this reason it may be combined with bitter intestinal tonics, such as Gentiana or Eupatorium perfoliatum (Cook) or with Rheum and Mentha (Ellingwood).
- ▶ To correct the cold nature of this herb, various authors have combined with Coriandrum (Cook), Zingiber (Cook, Shook, Ellingwood), Capsicum (Ellingwood), or Piper nigrum (Ellingwood).
- ▶ In Unani medicine it is combined with Pimpinella and honey to modify the harsh cold and dry effects.
- ▶ The dryness of Cassia may also be corrected with Glycyrrhiza in an equal portion, then Foeniculum ½ part, in sugar, 6 parts. (Ellingwood).

Rhamnus purshiana, frangula

- ▶ Of benefit in digestive disorders generally, and influences stomach, liver, and gall-ducts, as well as the bowel.
- ▶ Tonifies the venous circulation in the intestines and is of use in hemorrhoids.
- ▶ In sub-laxative doses, combine with other bitters and/or carminatives as appropriate, Coriandrum or Eletarria.
- ▶ A simple pair with Zingiber is classical in Physiomedicalism
- ▶ Whelan: combine with plenty of Foeniculum
- ▶ Zingiber for jaundice Clymer

